

## GRIP DRY RUN FORECAST FOR JULY 20, 2010

Tropical Areas of Interest Discussion: Created 1800 UTC July 20, 2010

**Summary:** Though there are a total of four tropical waves in the Atlantic/Caribbean/Gulf areas, our attention today is focused on the development potential of AL97, which the NHC has upgraded throughout the day from mid-grade chances for development, to a high probability of development into a tropical cyclone in the next 48 hours. Several aircraft in the tri-agency coordination are preparing to launch missions into this system, and some already have aircraft investigations underway. The environment is not immediately conducive for development and although there is not yet a low-mid level circulation, this system will be steadily moving into a more favorable environment of expected decreased shear and favorable SSTs near the Bahamas in the next 24-48 hours. Several factors are responsible for the spread in model forecasted track and intensity, but most global and regional models have converged on a solution of developing this system into a tropical cyclone in the 72-96 hour range with a good probability of a south Florida landfall, maybe even as a Category 1 hurricane.

### **Forecast: 1800 UTC July 20, 1010**

In the GRIP/IFEX/PREDICT domains today there are several features of note, but the most intriguing feature today is Invest AL97/PGI17L, which most of this discussion will focus upon. *Please see A.* Overall, there are 4 Easterly tropical waves to discuss. The first is located near 34\*W displaying low-level cyclonic flow and is embedded within the ITCZ. This system has shown consistent convection since emerging from Africa several days ago and should be monitored closely for when it nears the tri-agency flight domain. The second is located along 72\*W near Haiti and is the tropical wave associated with AL97/PGI17L (henceforth referred to as 97L). 97L was upgraded by the NHC today to a high probability of formation during the next 48 hours. The third wave is along 86W in the Eastern Gulf/ Western Caribbean, and is the wave that was formerly discussed as PGI16L. While this still carries a circulation, the disorganization of the decreased convection and its impending movement over land make it so this wave warrants little further discussion. The fourth wave in the Western Gulf of Mexico is near 93\*W and lies within a region of deep moisture producing numerous showers and thunderstorms, and is located to the south of a persistent upper tropospheric cold low in the mid-Gulf. Further development of either of the last two waves is not expected.

The huge area of high pressure dominating much of the Atlantic basin has continued to increase in pressure over the last 24 hours, and now is analyzed as a 1030 hPa ridge extending from Spain to Florida in an elongated oval. The ridge's structure and strength will be a big player in the determination of the track of 97L in the coming days, as well as the strength and movement of a TUTT (Tropical Upper Tropospheric Trough) located to the north of the system. The TUTT has been interacting with the developing Invest for a couple of days so far, aiding a region of high E-W shear that has inhibited the persistence of convection too far north of Puerto Rico. This morning there was a nice flare-up of convection in this region and was subject to this heavy shear (30-40kt), though convection to the south of Puerto Rico appears to be flaring again. *Please see B and E.*

One thing that Invest 97L is lacking (and there has been some debate about where it might form in the next 48 hours) is a defined center of circulation at mid-low levels. It is not currently present in satellite imagery, nor is one present in the radar reflectivity out of Puerto Rico. *Please see C.* ASCAT winds from an earlier pass do not indicate a circulation, only strong easterlies appear present at that time (see *D.*), although now there is a much more southerly component to the precipitation seen in the radar reflectivity.

The vorticity associated with 97L is beginning to stack nicely at levels 850, 700, and 500 hPa compared to yesterday (*please see F.*). This shows increased organization of the system, even though there is not yet a coherent circulation. Additionally, water vapor imagery plus AMSU TPW (total precipitable water) imagery overlain with the rain from the system shows how the convection associated with 97L is being encouraged by the extremely moist environment. *Please see G.* Also of note, some of the convection associated with 97L has been particularly deep with IR imagery indicating cloud top temperatures as cold as -70°C, and they are being supported by good upper level divergence also evident in the CIMSS products (*E*).

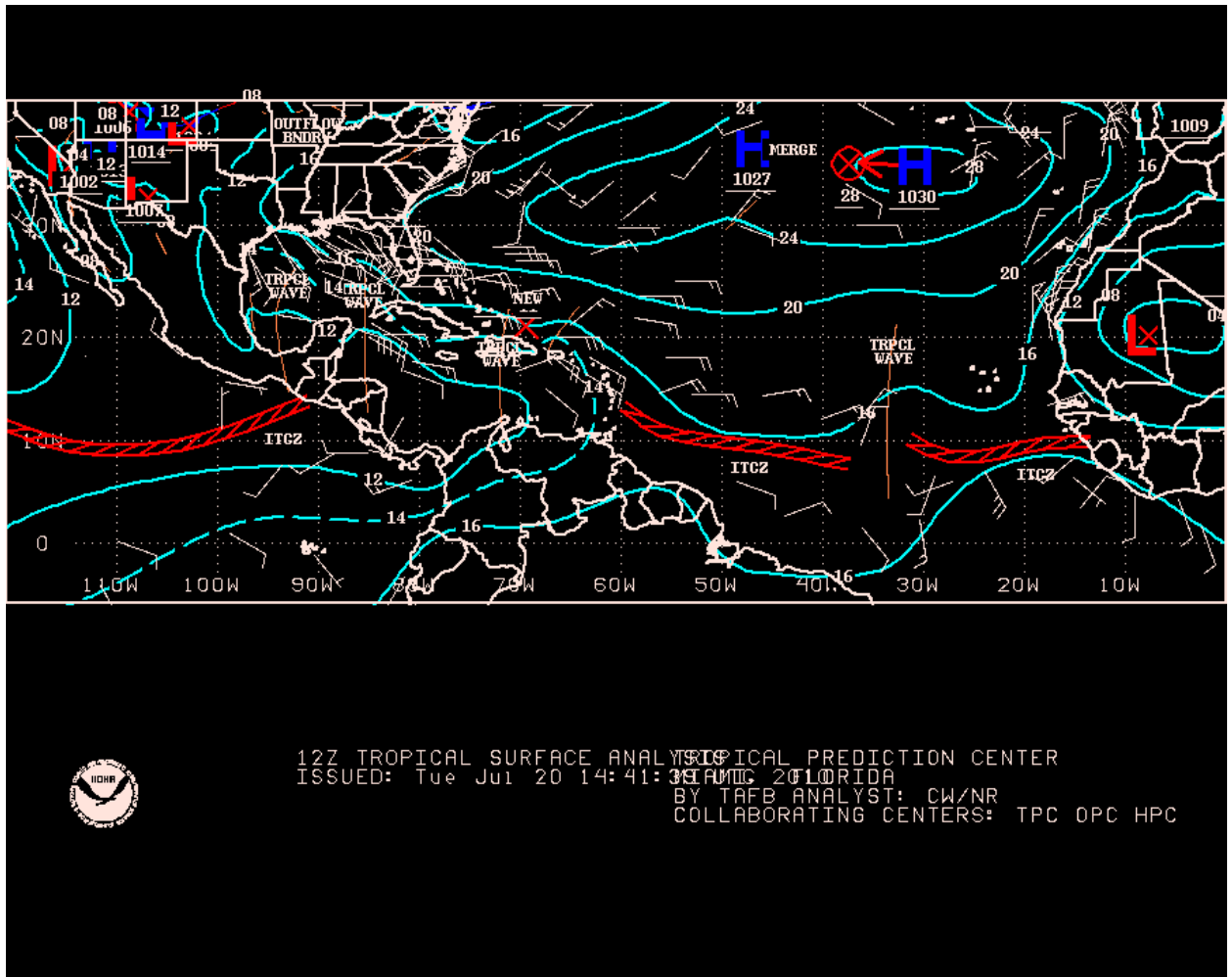
Over the next several days, the global models and the regional models have converged on the solution of expected development of this system into a tropical cyclone. Bob Hart's Phase space diagram, which utilizes the 06 UTC forecast by the HWRF model shows that it is expected to become a warm core cyclone in the next 60-72 hours (*please see H.*). This model is one of the most aggressive at developing the invest, and it even forecasts the system to cross Florida and reintensify in the Gulf of Mexico before making a second landfall in the FL Peninsula. One thing that several models do not seem to yet agree on is the expected track forecast of the system (*please see I. for the model forecasts of shear and mslp*). Perhaps this is due to the inability to locate a center point for vortex bogusing in the regional models, but the global models vary widely on taking the wave to the west on a more southerly route or a northerly track, and this depends on where the TUTT moves and its shear influence, as well as if the Subtropical high will experience any weakening near the East Coast of FL. The track and intensity spreads appear as seen in *J*. Most models have guided the official forecast to show intensification to a Category 1 hurricane can be expected within 72+ hours. SHPS keeps the shear low in the forecast based on the GFS fields it is initialized from as it follows the official forecast track. This track takes the system into SE Florida in the vicinity of Miami in 84-96 hours as a 70 kt Cat 1 hurricane (*please see K.*). Additionally, the Montgomery pouch tracking guidance based on the GFS and NOGAPS forecasts is divided, yet both intensify the system, at least in the short term, based on good values for the Okubo-Weiss parameter at 700 hPa and decreasing values of vertical shear associated with the pouch region of PGI17L (*please see L.*). This system will be closely monitored in the coming days by several aircraft missions by all of the three agencies. Please see the mission science report for more details on tri-agency flight expectations.

**See links to products used in discussion:**

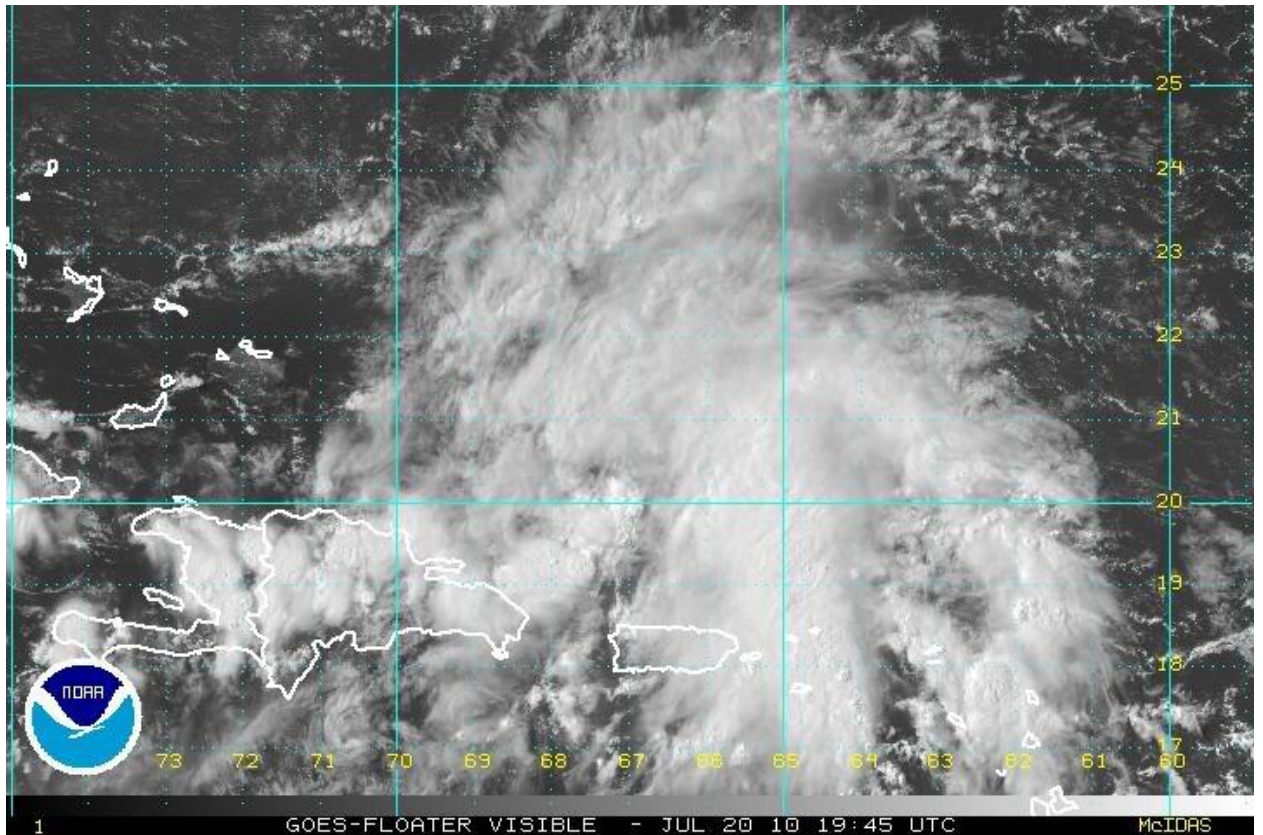
**A)** Tropical Surface Analysis (12 UTC) [http://www.opc.ncep.noaa.gov/UA/Atl\\_Tropics.gif](http://www.opc.ncep.noaa.gov/UA/Atl_Tropics.gif)

- B)** GOES Floater for AL97: Visible Imagery Loop <http://www.ssd.noaa.gov/goes/flt/t1/flash-vis.html>
- C)** Puerto Rico Radar  
<http://radar.weather.gov/radar.php?rid=JUA&product=NOR&overlay=11101111&loop=yes>
- D)** ASCAT winds: <http://manati.orbit.nesdis.noaa.gov/datasets/ASCATData.php>
- E)** 1500 UTC Shear from CIMSS: <http://cimss.ssec.wisc.edu/tropic2/real-time/windmain.php?&basin=atlantic&sat=wg8&prod=shr&zoom=&time=>
- F)** 1500 UTC Vorticity (Select 850 hPa and ascend through the levels selecting 700, then 500, then 200):  
<http://cimss.ssec.wisc.edu/tropic2/real-time/windmain.php?&basin=atlantic&sat=wg8&prod=vor&zoom=&time=>
- G)** Svetla's JPL Tropical Cyclone webpage overlaying observations of TPW and Rain:  
<http://grip.jpl.nasa.gov/grip/index.jsp>
- H)** Cyclone Phase Space Diagram for AL97 from Bob Hart's FSU website based on 06 UTC run of HWRF):  
<http://moe.met.fsu.edu/cyclonephase/hwrf/invest97l/fcst/archive/10072006/5.html>
- I)** Bob Hart's TC models page (CMC, GFS, GFDL, NOGAPS, HWRF): <http://moe.met.fsu.edu/tcgengifs/>
- J)** Colorado State TC guidance (including Official Guidance) for track and intensity:  
<http://euler.atmos.colostate.edu/~vigh/guidance/>
- K)** Current Operational Model Guidance forecasts for track and intensity (select N. Atlantic Frame 1 of each): <http://euler.atmos.colostate.edu/~vigh/guidance/>
- L)** Pouch tracking of AL97/PGI17L from the Montgomery page (select Pouch Time Series plots for GFS and NOGAPS): <http://www.met.nps.edu/~mtmontgo/PGI17L.html>

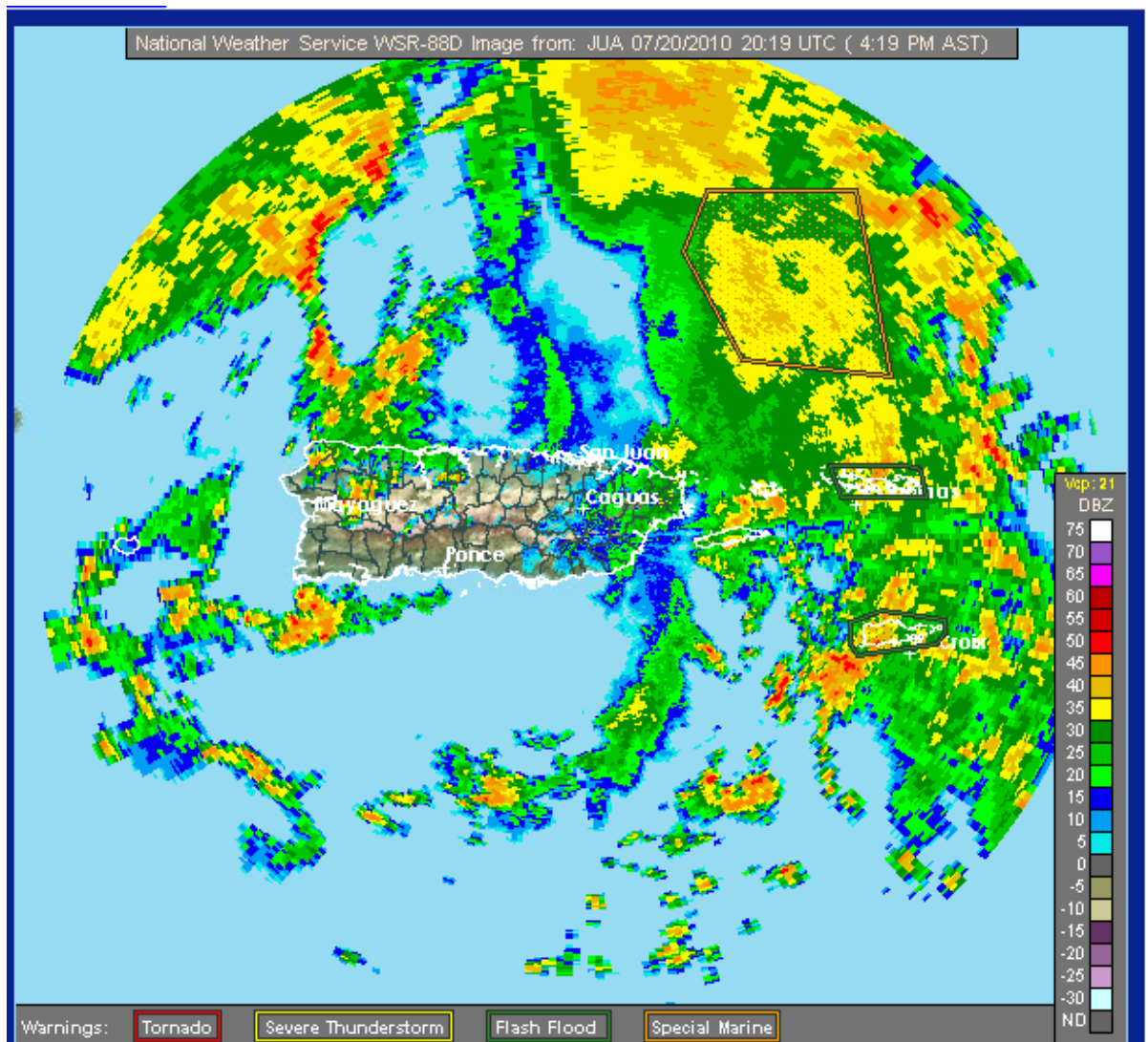
## **Static images:**



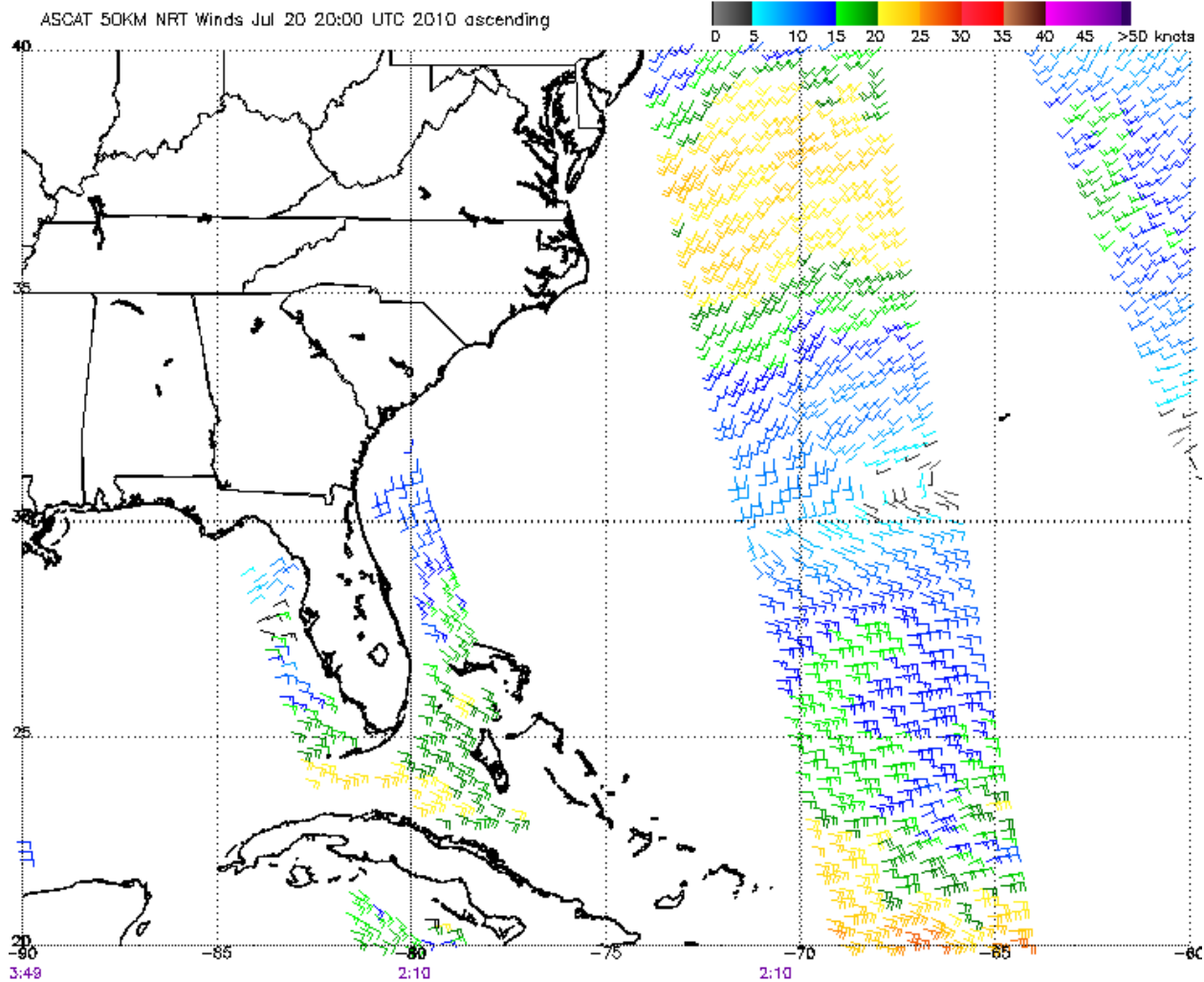
(A)



(B)



(c)

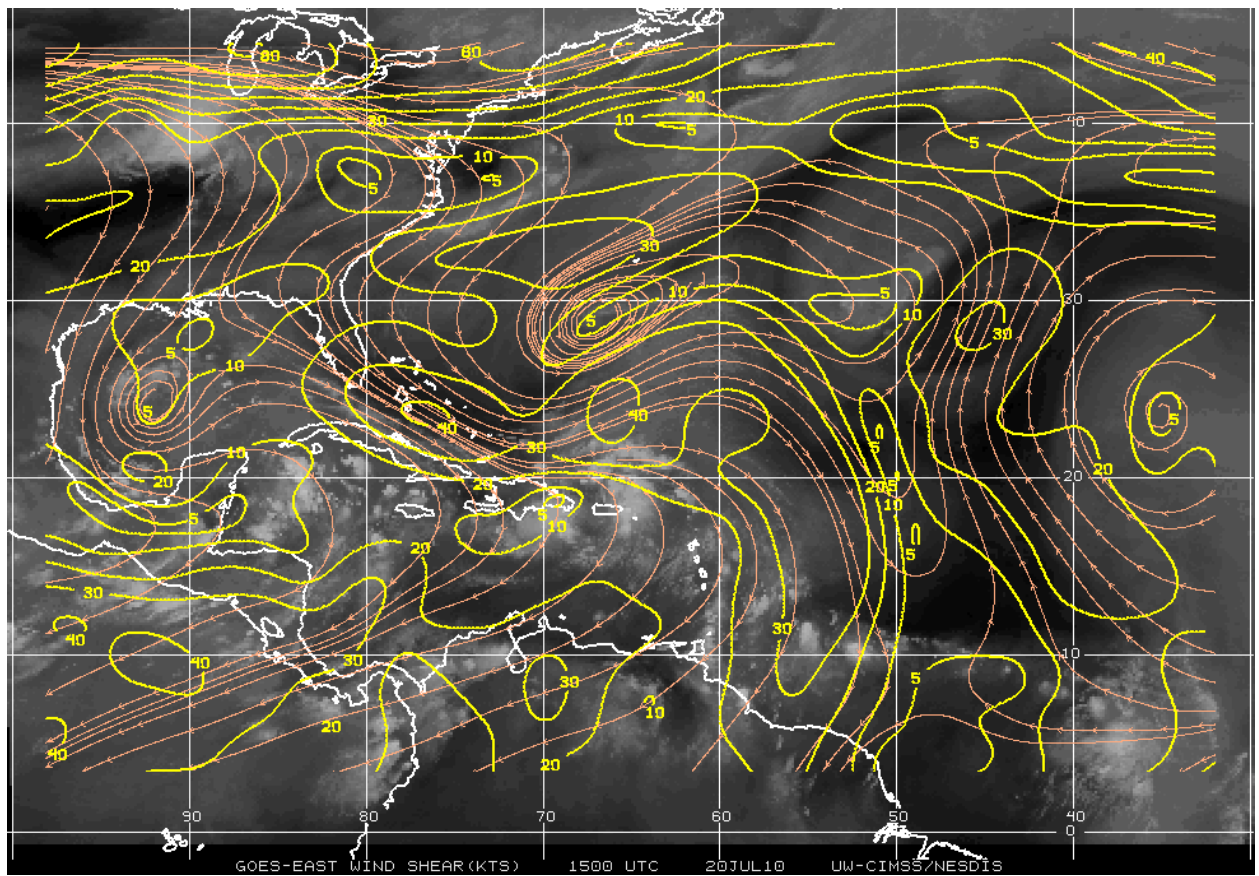


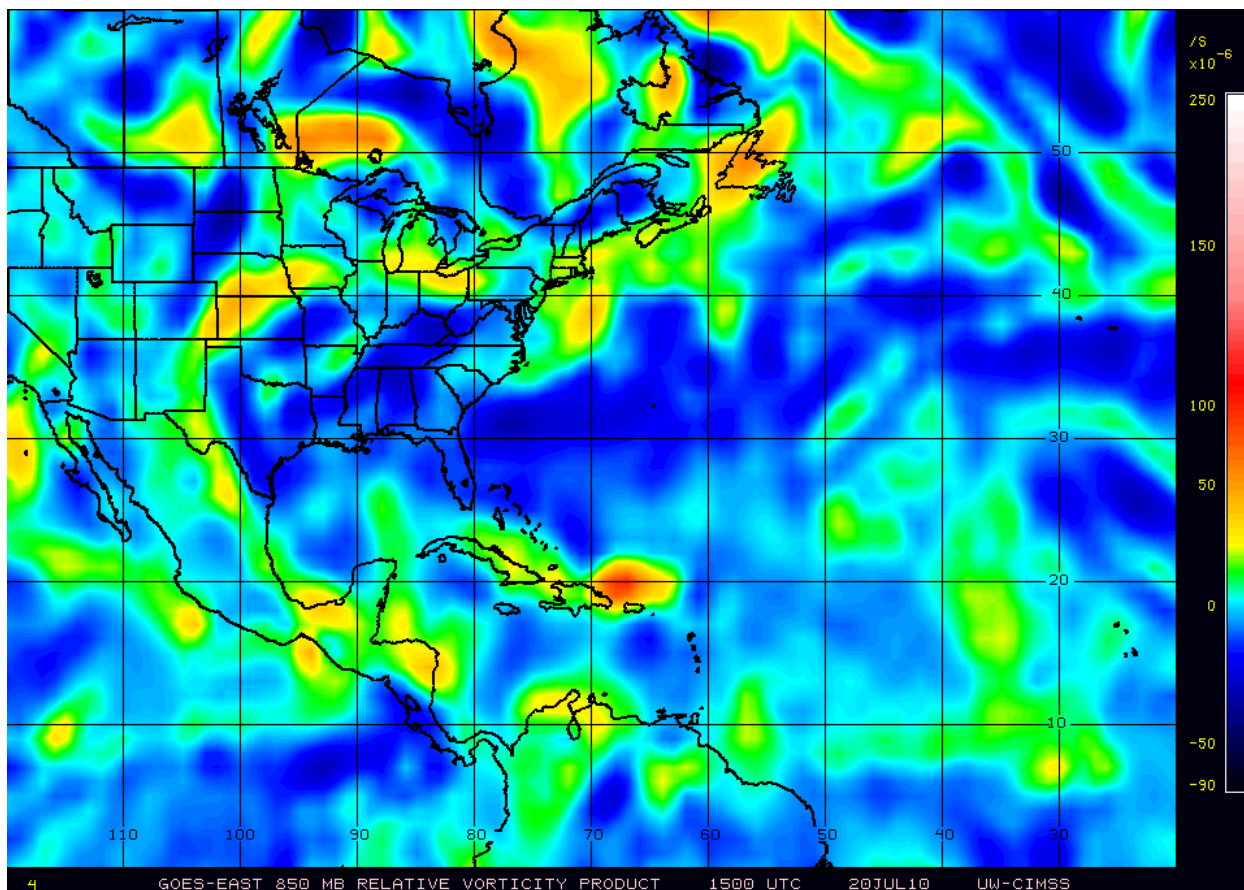
Note: 1) Times are GMT 2) Times along bottom correspond to measurement at 30N  
3) Data buffer is 22 hrs from Jul 20 20:00 UTC 2010 4) Black circles indicate possible contamination

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(D)

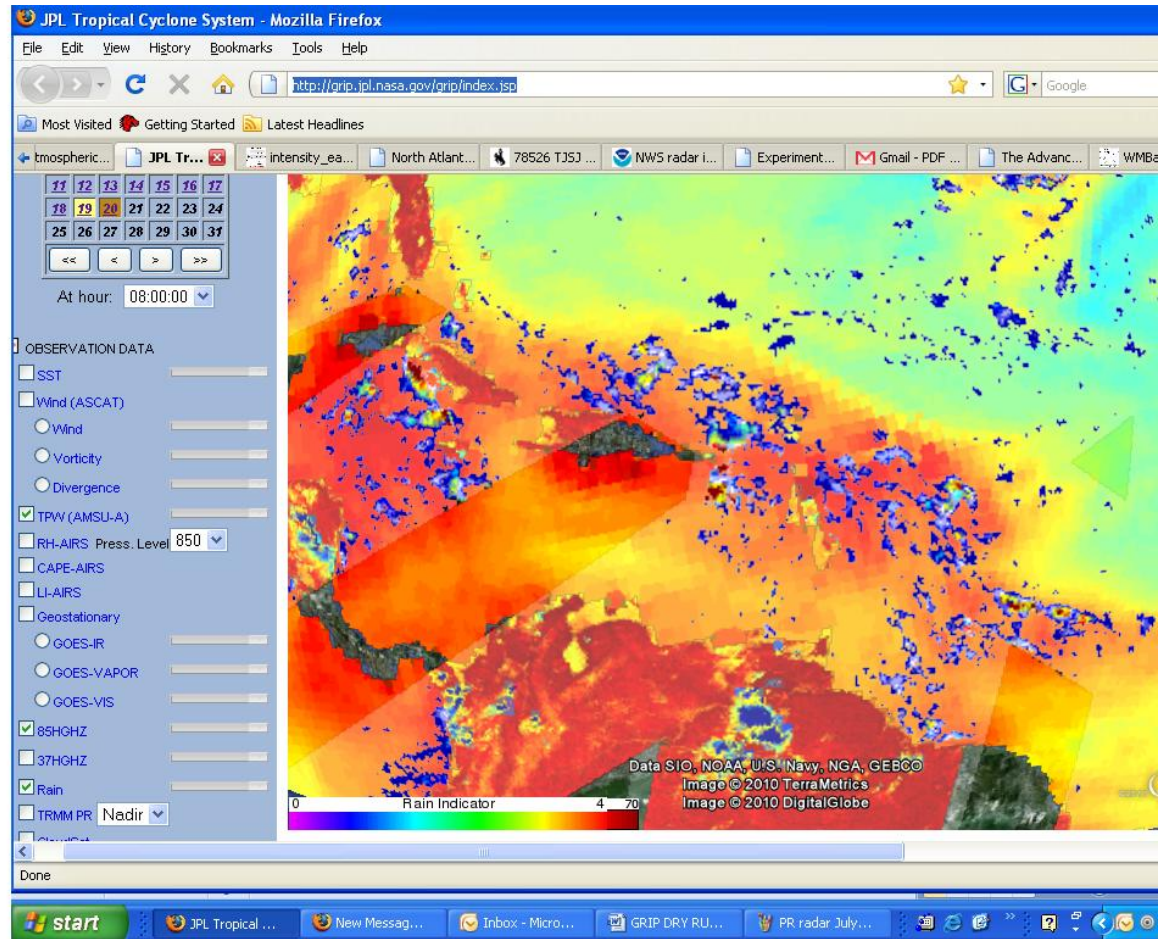
(E)





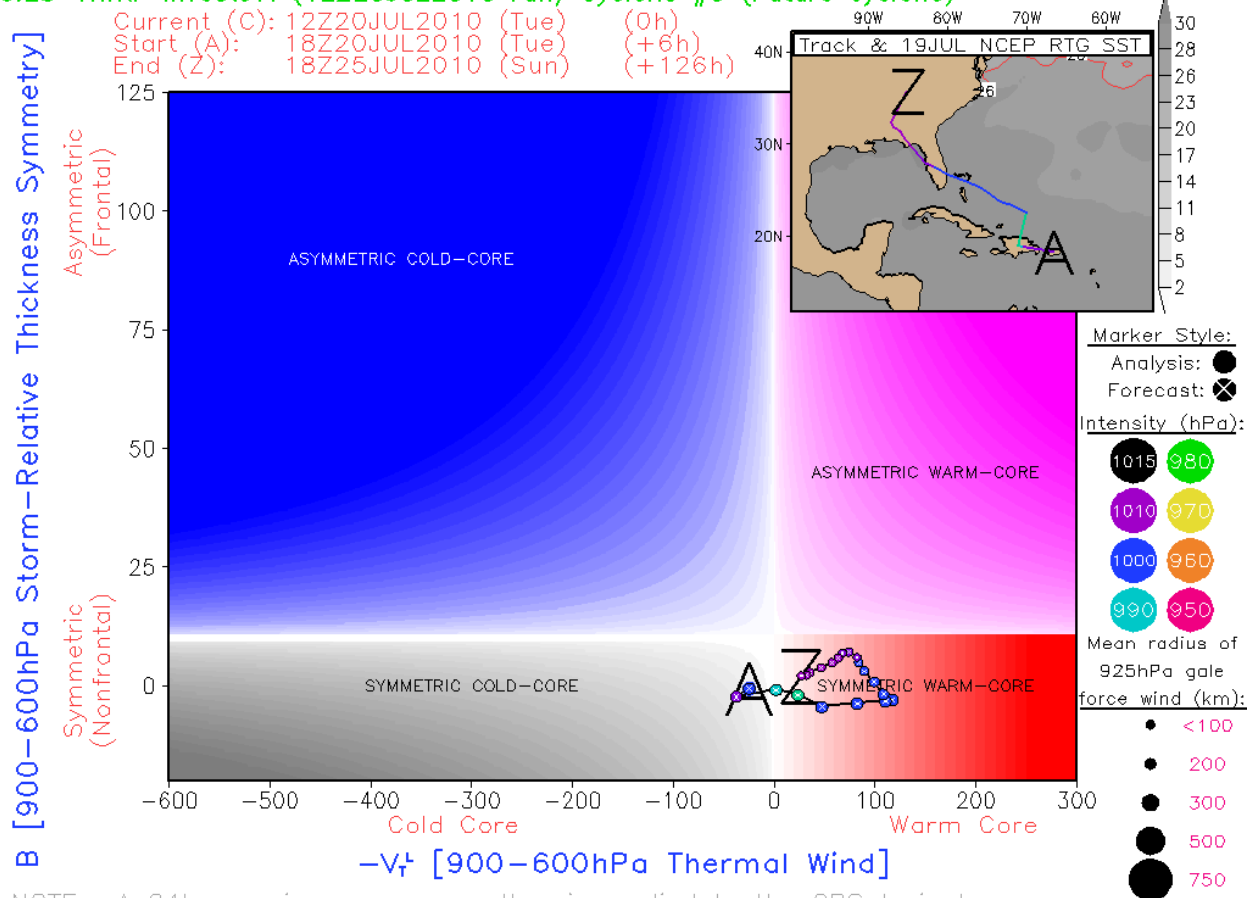
(F)

GOES-EAST 850 MB RELATIVE VORTICITY PRODUCT 1500 UTC 20JUL10 UW-CIMSS

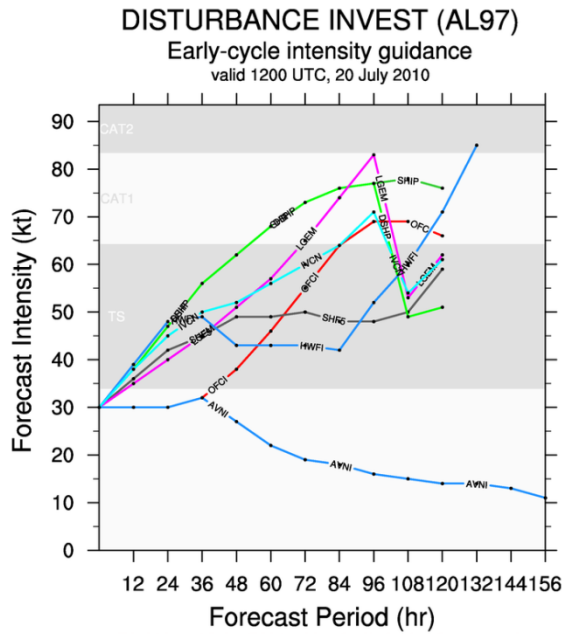


(G)

0.25° HWRf invest97I (12Z20JUL2010 run) Cyclone #5 (Future cyclone)



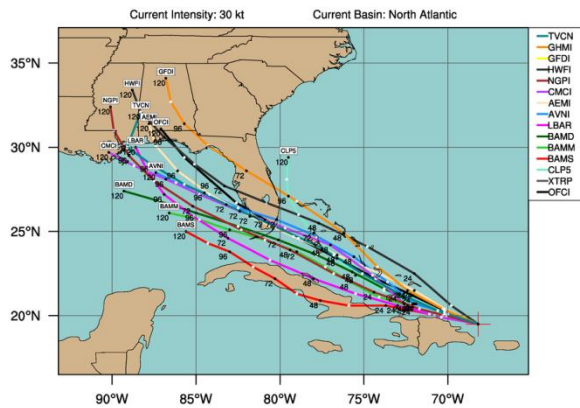
(H) NOTE: A 24hr running mean smoother is applied to the CPS trajectory.



(J&K)

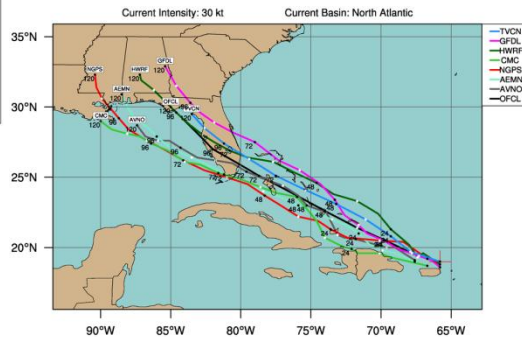
**DISTURBANCE INVEST (AL97)**

Early-cycle track guidance valid 1800 UTC, 20 July 2010



This plot does not display official storm information. Use for information purposes only.  
DO NOT USE FOR LIFE AND DEATH DECISIONS!

**DISTURBANCE INVEST (AL97)**  
Late-cycle track guidance valid 1200 UTC, 20 July 2010

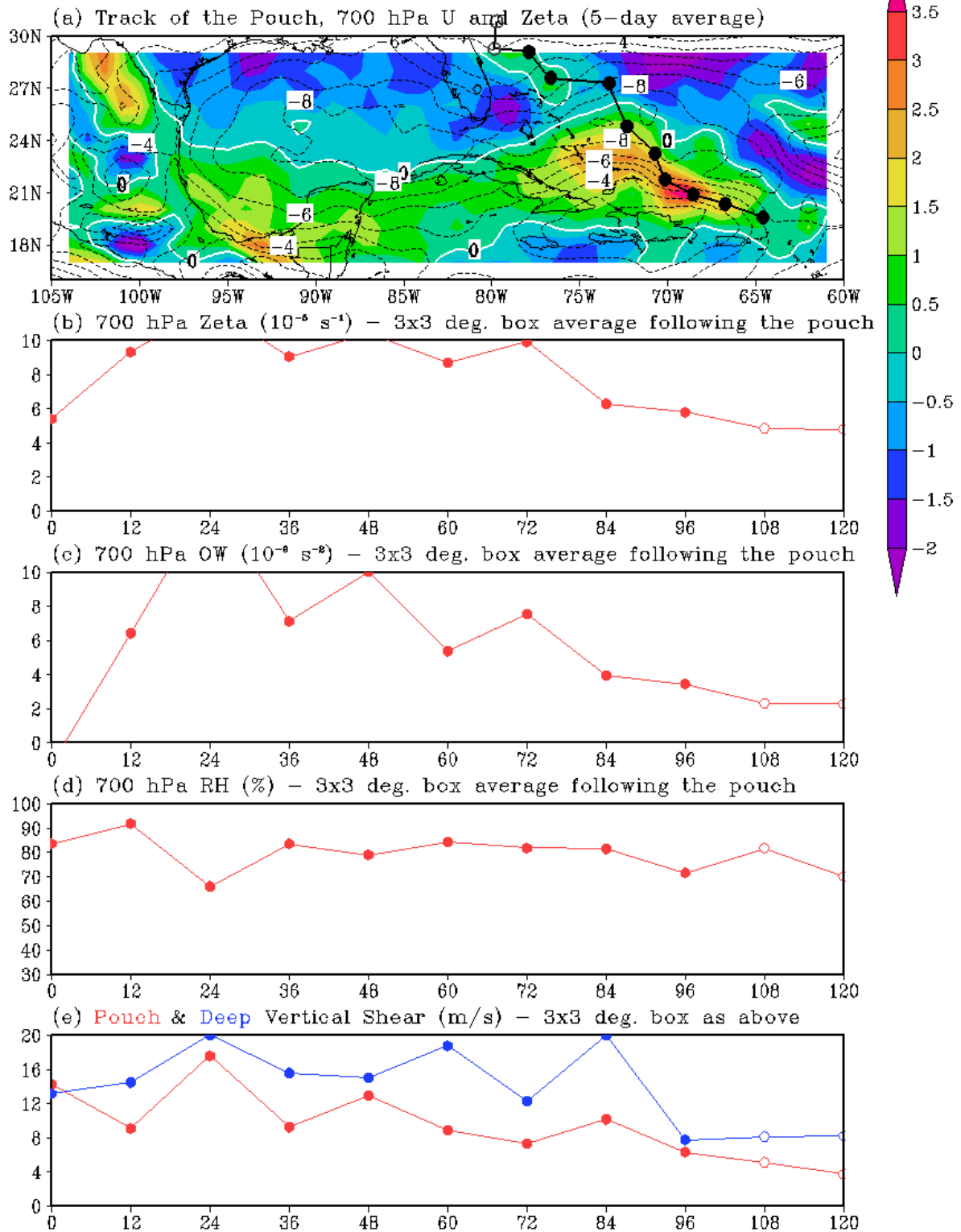


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(Please note these 3 images are now the 1200 UTC forecasts, and are more recent than those used in the forecast discussion).

(L)

PGI17L: 5-Day Forecast Based on gfs  
Initialized at 2010072000



# PGI17L: 5-Day Forecast Based on nogaps

Initialized at 2010072000

